

**WHAT IS CLAIMED IS:**

1. A wavelength division multiplexed passive optical network system, comprising:  
a central office);

a remote Node;

5 an optical fiber coupled between the central office and the remote node,

wherein the central office includes an optical power splitter) coupled to the optical fiber, wherein the optical power splitter (1) divides an upstream optical signal from the optical fiber into a plurality of upstream optical signals having substantially similar power and (2) outputs downstream optical signals to the optical fiber; and

10 a plurality of optical transceiver modules to (1) receive the plurality of upstream optical signals, and (2) output the downstream optical signals to the optical power splitter, and

wherein at least one of the optical transceiver modules having an optical transmitter including a semiconductor optical amplifier and a reflection-type optical fiber grating  
15 located at a predetermined distance from the semiconductor optical amplifier, the optical transmitter transmitting light of a pre-set wavelength resonating between the SOA and reflection-type optical fiber grating; and

wherein at least one of the optical transceiver modules having an optical receiver having an optical fiber grating for transmitting light of a predetermined wavelength and an  
20 optical detector for detecting light passing through the optical fiber grating.

2. The wavelength division multiplexed passive optical network system as set forth in claim 1, wherein the optical power splitter includes a first port coupled to the optical fiber.

3. The wavelength division multiplexed passive optical network system as set forth in claim 2, wherein the optical power splitter includes a plurality of second ports coupled to the optical transceiver modules.

4. The wavelength division multiplexed passive optical network system as set forth in claim 3, wherein the semiconductor optical amplifier is coupled to one of the plurality of second ports.

5. The wavelength division multiplexed passive optical network system as set forth in claim 3, wherein the optical power splitter further outputs the plurality of upstream optical signals to the plurality of second ports.

6. The wavelength division multiplexed passive optical network system as set forth in claim 5, wherein the remote node comprises an optical power splitter coupled to the and optical fiber.

7. The wavelength division multiplexed passive optical network system as set  
5 forth in claim 5, wherein the optical power splitter of the remote node includes a first port

located coupled to the optical fiber, and a plurality of second ports.

8. The wavelength division multiplexed passive optical network system as set forth in claim 5, wherein at least one of the optical transceiver modules further comprises a wavelength selectable coupler to output a downstream optical signal from the optical transmitter to the optical power splitter through the second port, and inputting an upstream optical signal received through the second port into the optical receiver.

9. The wavelength division multiplexed passive optical network system as set forth in claim 1, wherein wavelengths of the downstream and upstream optical signals have different wavelength bands.

10. A wavelength division multiplexed passive optical network system, comprising:

a central office to output a downstream optical signal;

a plurality of subscriber units to output upstream optical signals; and

an remote node to divide the downstream optical signal received from the central office into multiple downstream optical signals having the same power, transmitting the multiple downstream optical signals to the subscriber units, and outputting the upstream optical signals received from the subscriber units to the central office,

wherein at least one of the subscriber units comprises:

an optical transmitter including an semiconductor optical amplifier and a reflection-

type optical fiber grating located at a predetermined distance from the semiconductor optical amplifier, the optical transmitter transmitting an upstream optical signal of a pre-set wavelength resonating between the SOA and reflection-type optical fiber grating; and

an optical receiver including an optical fiber grating for transmitting only a downstream optical signal of a pre-set wavelength among the multiple downstream optical signals having the same power from the remote node and an optical detector for detecting light passing through the optical fiber grating.

11. The wavelength division multiplexed passive optical network system as set forth in claim 10, wherein the remote node comprises:

an optical Power Splitter) including a first port coupled to the optical fiber, and a plurality of second ports, wherein the optical power splitter divides the downstream optical signal from the optical fiber into the multiple downstream optical signals having the same power, transmits the multiple downstream optical signals to the subscriber units through the second ports, and outputs the upstream optical signals received from the subscriber units to the optical fiber.

12. The wavelength division multiplexed passive optical network system as set forth in claim 10, wherein each of the subscriber units further comprises a wavelength selectable coupler to separately output the upstream optical signal received from the optical transmitter, and separately output the downstream optical signal received from the remote node to the optical receiver.